

REMARKS

The above amendments and these remarks are responsive to the Office action dated September 19, 2005. Claims 1-19 are pending in the application.

Applicants confirm the oral election of the species of the claimed invention of claims 5-8, 12-15, 18 and 19 made in response to a requirement for election of species. Accordingly, claims 1-4, 10, 11, 16 and 17, drawn to a second species, are withdrawn from consideration. Claim 9 is considered to be generic.

Claims 5, 9, 12 and 18 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Publication No. 2002/0130804 to McMakin et al. Claims 6, 7, 8, 13, 14, 15 and 19 stand rejected as being unpatentable over McMakin in view of U.S. Publication No. 2002/0044102 to Yokoshima et al. The applicants have considered the cited references and the statements of the Examiner, but conclude that the claims as filed should be considered allowable over these references. In view of the remarks below, the applicants respectfully request reconsideration of the application under 37 C.F.R. § 1.111 and allowance of the pending claims without amendment.

Description Amendment

The first paragraph of the specification is updated by replacing the references to pending applications with associated resulting patent and patent publication numbers.

Claim Objection

Claim 7 was objected to because the term "array" was considered to have been

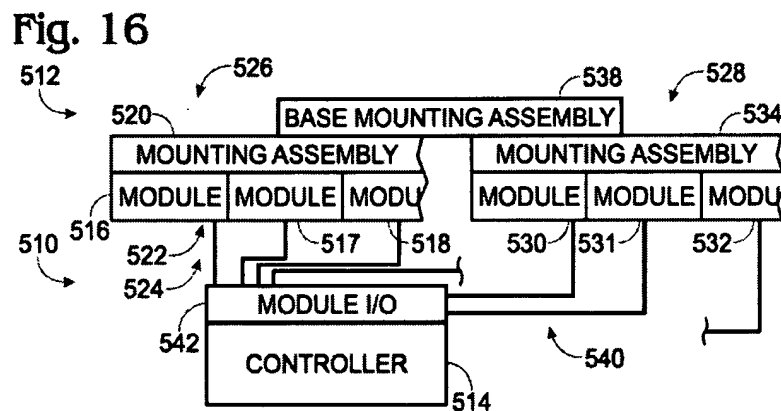
used in previous claims to describe several different parts of the invention, and that it should be changed to "antenna array." Claim 7 depends from claim 6, which in turn depends from claim 5. Although the term "array" is used as an adjective in a couple of instances ("array frame" and "array segments"), it is used only once as a noun ("antenna array"). All of these uses are consistent and refer to the array and the frame of the array and the segments of the array. There is only one array mentioned in the claims. Therefore, it is submitted that reference to that array simply as the array is clear as to what is referred to. However, in that the meaning is the same, claim 7 is amended to include the suggested language.

Rejections under 35 USC § 102

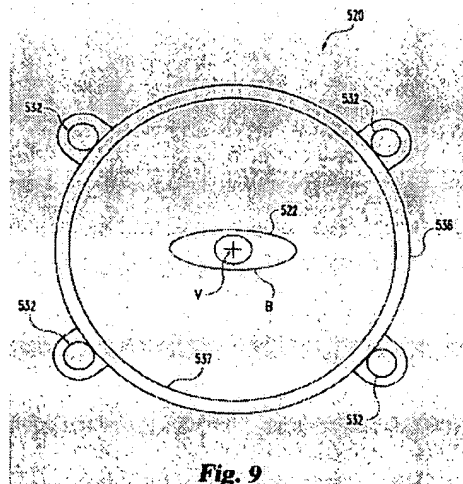
Claims 5, 9, 12 and 18 stand rejected as being anticipated by McMakin. Claim 5 is directed to an imaging system comprising an array frame; a plurality of antenna array segments adapted to be mounted to the array frame, each array segment including a segment frame, a plurality of antenna units mounted relative to the segment frame and configured to transmit toward and receive from a subject in a subject position, electromagnetic radiation in a frequency range of about 200 MHz to about 1 THz, from antenna positions spaced from the subject position, the array segments being adapted to be mounted to the array frame with the antenna units from the array segments collectively forming an antenna array; a transceiver configured to operate the antenna array and produce an output representative of the received radiation; and a processor adapted to convert the transceiver output into image data representative of an image of

the subject.

An example of such a structure is illustrated by Figure 16, shown below. Array 524 includes plural segments 516, 517 and 518 mounted on a common mounting assembly or array frame 520. Array 524 is included in interrogation segment 526. A second, separate interrogation segment 528 includes a separate array including array segments 530, 531 and 532 mounted on array frame 534. Interrogation segments 526 and 528 are mounted on a common base mounting assembly 538.



McMakin, on the other hand, discloses a portal having a single continuous array 536 mounted on an array frame 532, as is shown in Figure 9.



At paragraph 10, in the Summary of the Invention, McMakin does state that a system includes at least one array to interrogate an object. The phrase "at least one" suggests that there could be more than one array. Thus, it is possible that there could be two arrays 536. If this were so, then the arrays would each be used to scan different parts of the object as discussed further below. There is no description or suggestion of how additional arrays would be structured other than each array presumably would include a plurality of antenna units on an array frame.

Claim 5 of the subject application defines structure associated with one array formed as a plurality of array segments mounted to an array frame, with a segment formed of a plurality of antenna units mounted to a segment frame. The antenna units in the plurality of segments form an antenna array. An antenna array used for interrogating a subject may include a plurality of typically regularly spaced antenna units. As stated on page 2 of the specification, the antenna apparatus may include, for example, a linear or two-dimensional array of antenna units that transmits and receives radiation from positions spaced from the subject position and distributed along a locus of points or aperture facing the subject. Different arrays of antenna units are thus formed of different, discontinuous arrangements of antenna units.

An example of an antenna apparatus with more than one array is illustrated in U.S. Patent Publication No. 2004/0263379, and in particular Figure 9. This reference thus gives an example of how the term "array" is conventionally used in the art. An array is a regular order or series of antenna units, but it is not a broken or separated series of antenna units. Figure 9 shows two horizontal arrays 336, one on each side of

a subject and supported on respective guide rods 337. There is no teaching or suggestion in these references of the claimed structure for a single array. Accordingly, they do not anticipate claim 5, and withdrawal of the rejection is requested.

Claim 9 is directed to an antenna array segment comprising a segment frame; a plurality of antenna units mounted relative to the segment frame and configured to transmit toward and receive from a subject in a subject position, electromagnetic radiation in a frequency range of about 200 MHz to about 1 THz, from antenna positions spaced from the subject position; the array segment being adapted to be mounted to an array frame with other array segments with the antenna units from the array segments collectively forming an antenna array as part of an imaging system including a transceiver configured to operate the antenna array and produce an output representative of the received radiation, and a processor adapted to convert the transceiver output into image data representative of an image of the subject.

As discussed above with reference to claim 5, McMakin does not disclose at least an array segment adapted to be mounted to an array frame with other array segments with the antenna units from the array segments collectively forming an antenna array. To the contrary, McMakin discloses only a single array on an array frame. There is no teaching or suggestion of forming a single array using a plurality of array segments. Plural arrays, as suggested by McMakin and discussed above, do not form a single array, as the term is understood and used in the art. Rather, plural arrays simply form plural arrays. A plurality of physically associated antenna units form an array. Accordingly, claim 9 is not anticipated by the cited references, and withdrawal of the

rejection is appropriate.

Claim 12 is directed to a method of imaging comprising transmitting toward a subject in a subject position, electromagnetic radiation in a frequency range of about 200 MHz to about 1 THz, from a plurality of antenna array segments, each array segment including a plurality of antenna units, with the antenna units from the array segments collectively forming an antenna array; receiving at each of the plurality of antenna array segments electromagnetic radiation reflected from the subject; producing a segment output representative of the radiation received at each array segment; and converting the segment output into image data representative of an image of the subject.

As discussed above, McMakin discloses scanning a subject by moving a single circular array along the full length of the subject. In an embodiment having more arrays, each array scans a separate portion of the subject, as shown in U.S. Patent Publication No. 2004/0263379. McMakin does not then disclose or suggest transmitting from or receiving radiation at a plurality of antenna array segments each including a plurality of antenna units of an antenna array. For the reasons discussed above with reference to claims 5 and 9, it is submitted that claim 12 is not anticipated by the references of record, and withdrawal of the rejection is appropriate.

Claim 18 is directed to a system of imaging comprising means for transmitting toward a subject in a subject position, electromagnetic radiation in a frequency range of about 200 MHz to about 1 THz, from a plurality of antenna array segments, each array segment including a plurality of antenna units, with the antenna units from the array

segments collectively forming an antenna array; means for receiving at each of the plurality of antenna array segments electromagnetic radiation reflected from the subject; means for producing a segment output representative of the radiation received at each array segment; and means for converting the segment output into image data representative of an image of the subject.

As discussed above, McMakin does not disclose a plurality of antenna array segments that each includes a plurality of antenna units forming an antenna array. For the reasons discussed above, claim 18 is not anticipated by the references of record, and withdrawal of the rejection is appropriate.

Rejections under 35 USC § 103

Claim 5 also stands rejected as being unpatentable over McMakin, citing paragraph 10 which references "at least one array." As discussed above, the phrase "at least one" suggests that there could be more than one array. Thus, it is possible that there could be two arrays 536 in the portal disclosed by McMakin et al. If this were so, then the arrays would each be used to scan different parts of the object, as illustrated in U.S. Patent Publication No. 2004/0263379. There is no description or suggestion of how each array is structured, other than that it inherently includes antenna units on an array frame.

Claim 5 defines structure associated with one array formed as a plurality of array segments mounted to an array frame, with a plurality of antenna units mounted to each segment, with the antenna units from the plurality of segments forming an antenna

array. An antenna array used for interrogating a subject includes a plurality of typically regularly spaced antenna units. As stated on page 2 of the specification, the antenna apparatus may include, for example, a linear or two-dimensional array of antenna units that transmits and receives radiation from positions spaced from the subject position and distributed along a locus of points or aperture facing the subject. Different arrays of antenna units are thus formed of different, discontinuous arrangements of antenna units. An example of an antenna apparatus with more than one array is illustrated in U.S. Patent Publication No. 2004/0263379, and in particular Figure 9. This reference thus gives an example of how the term "array" is conventionally used in the art. An array is a regular order or series of antenna units, but it is not a broken or separated series of antenna units. Figure 9 shows two horizontal arrays 336, one on each side of a subject and supported on respective guide rods 337. There is no teaching or suggestion in these references of the claimed structure of a single array. Accordingly, they do not anticipate claim 5, and withdrawal of the rejection is appropriate.

Claims 6, 7, 8, 13, 14, 15 and 19 stand rejected as being unpatentable over McMakin in view of Yokoshima. These claims are patentable for at least the reasons that the base claims from which they depend are patentable.

Regarding claims 6, 13 and 19, Yokoshima is relied upon as showing a plurality of antenna array segments oriented at different angles relative to each other. It is submitted that Yokoshima does not disclose an antenna array of a plurality of antenna units, as required by the claims, but rather a single antenna A1 having antenna elements E1 and E2 connected electrically in series.

Antenna elements E1 and E2 have respective coils 1a and 1b with respective coil portions 11a and 11b. The coil portions of antenna elements E1 and E2, in combination, function together to form a single antenna producing a single beam. As stated in paragraph 17, because the conductor pattern 11a of the antenna element E1 and the conductor pattern 11b of the antenna element E2 intersect at an angle of 90 degrees, it is possible to obtain a uniform radiation pattern as shown in Figures 5 and 6 produced by the combination of conductor patterns 11a and 11b.

As stated on page 5 of the specification, at lines 12-15, the antenna units may have one or more individual antennae that transmit or receive like polarization or unlike polarized waveforms and may have narrow or broad angular radiation beam patterns. Following this language, it is seen then that Yokoshima discloses a single antenna, which in the application described, may form an antenna unit in the terms of the present specification. Thus, Yokoshima does not disclose antenna units or antennae that are oriented at different angles, because only one antenna is disclosed. Accordingly, McMakin and Yokoshima do not individually or in combination disclose the claimed imaging system.

Claim 19 is specifically directed to means for transmitting radiation from antenna array segments oriented at different angles relative to each other along the array. As mentioned, neither McMakin or Yokoshima disclose an antenna array formed of array segments, with each segment having a plurality of antenna units. There correspondingly is no disclosure of array segments disposed at different angles.

Regarding claims 7 and 14, as discussed above, there is no disclosure or

suggestion in McMakin and/or Yokoshima of forming an array along an arc using a plurality of array segments.

There also is correspondingly no disclosure or suggestion of such a array in which the plurality of antenna units in each antenna array segment extend rectilinearly along the segment frame relative to which they are mounted, as generally provided by claims 8 and 15.

Witte was relied upon to show the claimed rectilinear arrangement. However, Witte does not disclose an array of antenna units mounted on a plurality of array segments. Witte discloses only a rectilinear array of antennae. Claims 8 and 15 depend respectively from claims 7 and 14, and hence are directed to an arc array formed of rectilinear array segments. This configuration is not disclosed or suggested by the combination of references. Further, optimum performance is not necessarily achieved by making an array rectilinear instead of arched. The circular array of McMakin et al. has a more uniform distance between each antenna unit and a subject, than would a rectilinear array as disclosed by Witte. The claimed invention provides economy of construction with the use of rectilinear array segments arranged in an arc, thereby achieving most of the benefits of the arc configuration of the array. The cited references do not disclose or suggest such a configuration.

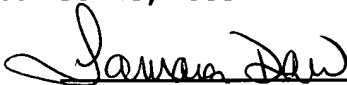
Conclusion

Applicants believe that this application is now in condition for allowance, in view of the above amendments and remarks. Accordingly, applicants respectfully request

that the Examiner issue a Notice of Allowability covering the pending claims. If the Examiner has any questions, or if a telephone interview would in any way advance prosecution of the application, please contact the undersigned attorney of record.

CERTIFICATE OF MAILING


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